Models of Attention:
Filter and Limited Resource Models

Lesson III: Attention
module 14

University of Idaho

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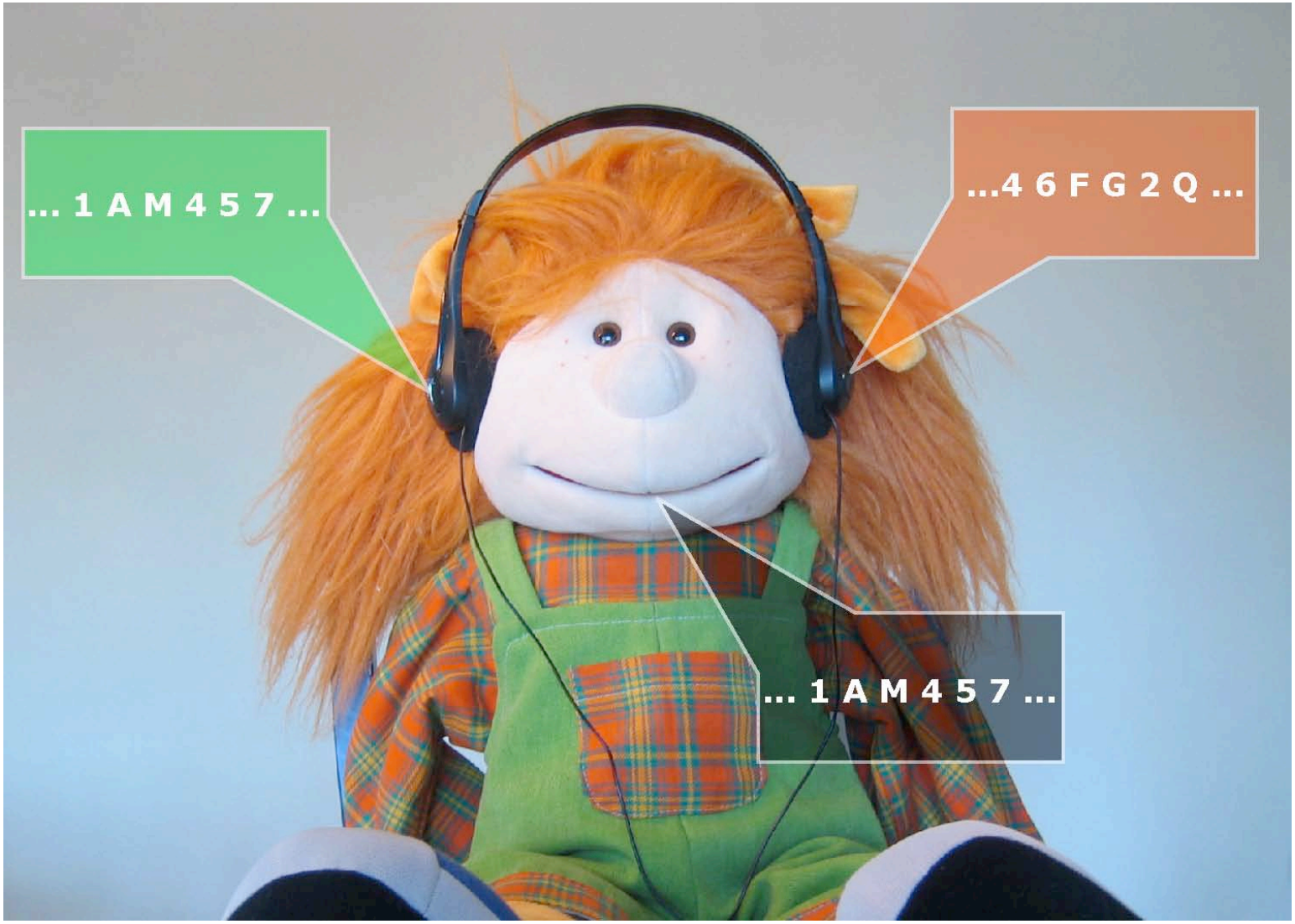
SHARE
IT

Case of selective attention: Shadowing



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Models of selective attention

- **Three classes of models (not mutually exclusive)**
  - Filter models of attention
  - Neisser's pre-attentive and attentive processing
  - Limited resource models of attention
- **Filter models**
  - differ in their assumptions on how far unattended information is processed
  - Early vs. late filter models
- **Limited resource models**
  - differ in their assumptions about the number of resource pools available
  - Single pool or multiple modality-specific pool

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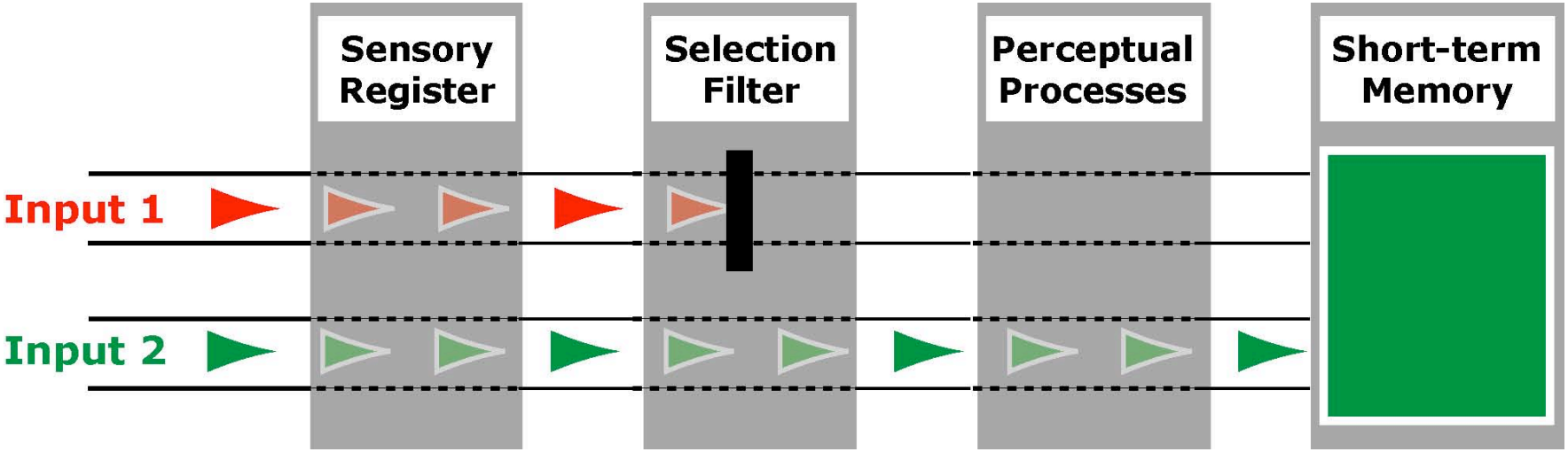
Broadbent (1958): Filter theory of attention



- **Information is blocked early for unattended channel**
  - Information is filtered at an early, sensory level
  - Only 1 channel of sensory information proceeds through this filter (bottleneck) and is interpreted
  - Other stimuli with salient sensory characteristics can also pass through this filter

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Filter theory: Early selection

- **Characteristics of the model**
  - Information is filtered at an early, sensory level
  - Only information in 1 channel can proceed (bottleneck)
  - Only this information is interpreted
  - Other stimuli with salient sensory characteristics can also pass through this filter
- **Evidence**
  - Not much is remembered about the unattended information
- **Problems**
  - Moray's finding that people recognize their name in the unattended channel
  - Treisman's finding of semantic processing of the unattended message (e.g., semantic continuity)

What's processed in the unattended channel?

While you are sitting in class you might learn a / that might not be good for your skin ...
On the beach you can bath in the sun but / piece of information that is relevant ...
While you are sitting in class you might learn a / ... piece of information uh ... that might not be good for your skin

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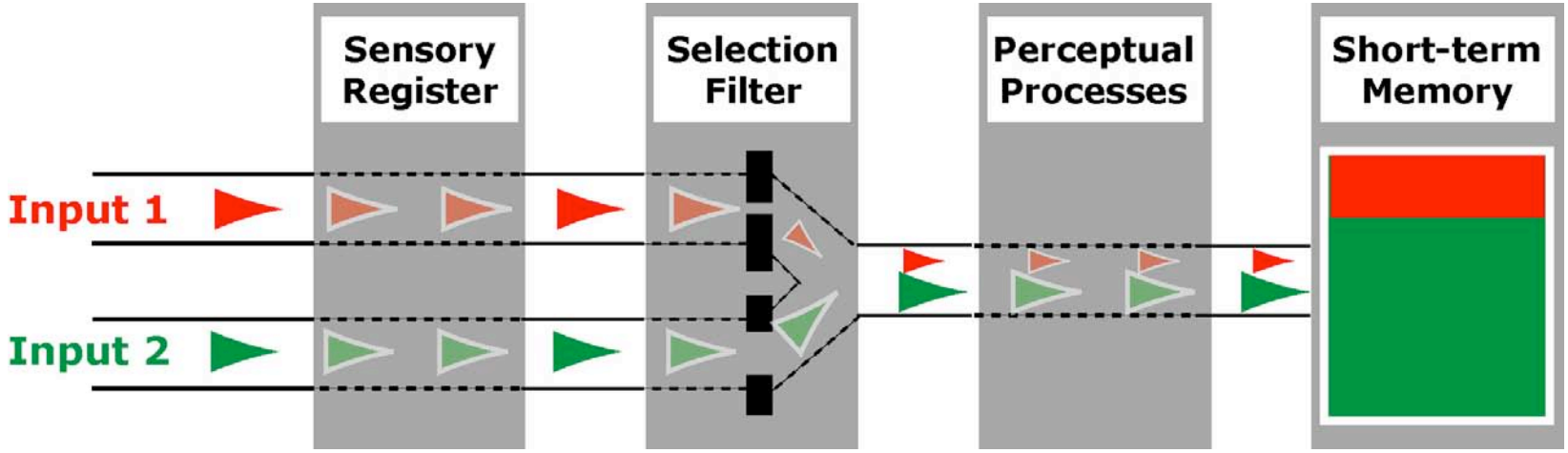
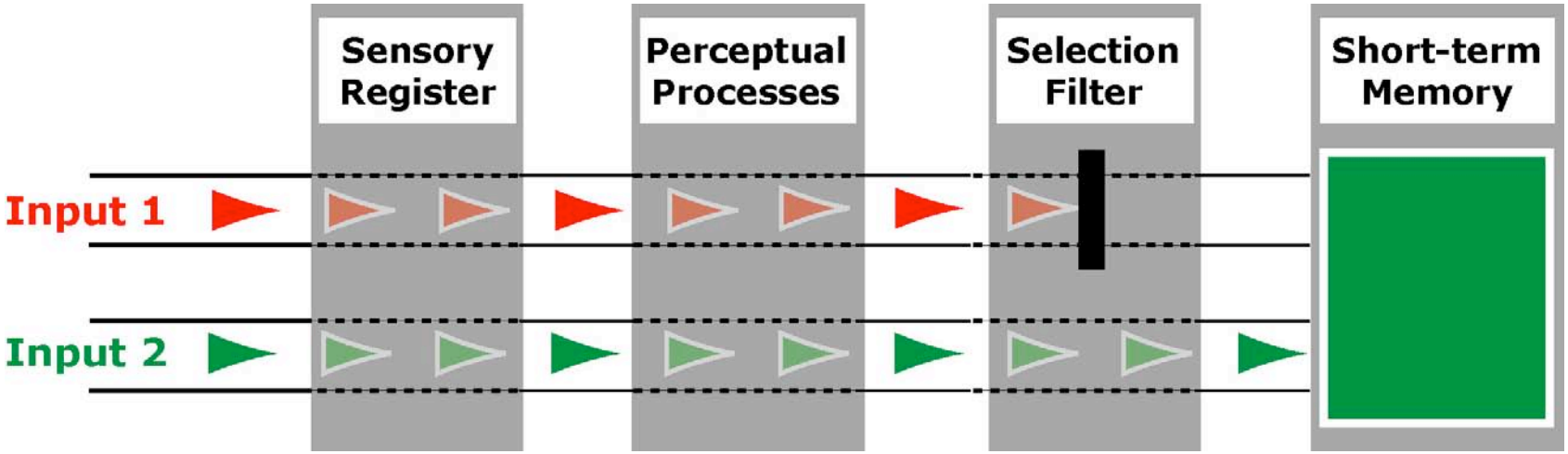
Treisman (1960): Attenuation model



- **Information is attenuated differentially for channels**
  - A filter determines how much information from each channel is being processed
  - Perceptual processing is limited in capacity
  - This model allows for highly relevant information to be interpreted, even if the channel is not attended to

Deutsch & Deutsch (1963): Late Selection



- **Information from all channels is perceptually processed**
  - Selection occurs late, after perceptual processing has interpreted the stimulus
  - Processing bottleneck occurs when items have to be placed in short-term memory

Neisser's (1967) "two stages" view

- **Preattentive processing**
  - Automatic, fast, parallel
  - Mainly analysis of physical characteristics
  - Limited semantic processing (e.g., one's name)
  - No deep semantic processing / analysis
  - Some initially attentive processing can get automatized through extensive practice
  - Is the basis for perceptual grouping
- **Attentive processing**
  - Controlled, slow, serial
  - Requires attentional resources
  - Enables semantic processing and synthesis

The Stroop (1935) effect

- Evidence for preattentive processing...

yellow	blue	red	green	blue	yellow
green	red	green	blue	red	blue
yellow	red	yellow	green	green	red
green	blue	blue	green	blue	red
blue	green	red	yellow	blue	green
green	blue	red	red	yellow	blue

Read the color words out loud as quickly as possible

The Stroop (1935) effect

yellow	blue	red	green	blue	yellow
green	red	green	blue	red	blue
yellow	red	yellow	green	green	red
green	blue	blue	green	blue	red
blue	green	red	yellow	blue	green
green	blue	red	red	yellow	blue

Read the color words out loud as quickly as possible

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The Stroop (1935) effect

- **Preattentive processing**
  - Reading is automatic for skilled readers
  - Doesn't require many resources
  - Can't easily be suppressed
- **Reading the words leads to activation of competing verbal responses**
  - Processing the color leads to activation of the color name (verbal response)
  - Processing the letters leads to activation of the word's phonology (verbal response)
  - The conflict has to be resolved at the response selection stage

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